Exemption No. 5587G

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of

BAE Systems Regional Aircraft (formerly British Aerospace Regional Aircraft)

for an exemption from §§ 25.562(c)(5) and 25.785(a) of Title 14, Code of Federal Regulations

Regulatory Docket No. 27001

GRANT OF EXEMPTION

By letter AWR/J41/250/200184 dated August 28, 2000, M. J. Tuson, Airworthiness Manager, Jetstream, BAE Systems Regional Aircraft (formerly British Aerospace Regional Aircraft), Prestwick International Airport, Ayrshire KA9 2RW, Scotland, petitioned for an amendment to Exemption #5587F. Exemption #5587F was regarding the Head Injury Criterion (HIC) of §§ 25.562(c)(5) and 25.785(a) of Title 14, Code of Federal Regulations (14 CFR). This exemption, if granted, would allow the retrofit of front row passenger seating in Jetstream Series 4100 airplanes already delivered. The existing exemption expires on December 31, 2000.

The petitioner requests relief from the following regulations:

> **Section 25.785(a)** requires that each seat, berth, safety belt, harness, and adjacent part of the airplane at each station designated as occupiable during takeoff and landing must be designed so that a person making proper use of those facilities will not suffer serious injury in an emergency landing as a result of inertia forces specified in §§ 25.561 and 25.562.
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> **Section 25.562(c)(5)** requires that each occupant must be protected from serious head injury under the conditions prescribed in paragraph (b) of this section. Where head contact with seats or other structure can occur, protection must be provided so that the head impact does not exceed a Head Impact Criterion (HIC) of 1,000 units.

The petitioner's supportive information is as follows:

"Compliance with Federal Aviation Regulations (FAR) 25.562(c)(5), Head Injury Criteria, was a Type Certification requirement for this aircraft type and was not satisfied for seats immediately behind bulkheads, partitions, etc. Exemption #5587 was raised to record this fact and subsequent extensions to this exemption have been granted. [Exemptions #5587A through #5587F refer].

"BAE Systems are developing a solution for compliance with JAR 25.562(c)(5) for front seat row Head Injury Criteria [HIC] by means of installing AmSafe Aircraft Inflatable Restraint [AAIR] system to each of the three front seats.

"Requests for FAA approval [through CAA bilateral agreement] and JAA approval of the Major Modification JK 42997, covering this change, were made in June 1999 with an original targeted certification date of the end of September 2000.

"Close liaison with CAA/ JAA has been carried out at all times during this programme, both for technical certification purposes and for necessary monitoring of the progress towards certification and installation of the modification to achieve the joint FAA/ JAA deadline of the end of 2000.

"BAE Systems have previously certificated an acceptable solution to front row HIC, namely the Shoulder Harness Restraint System [SHRS]. Because this imposes restrictions on front row occupancy, U.S. and other worldwide operators have resisted the implementation of the SHRS in favour of the AAIR.

"Because the SHRS is time consuming to install, BAE implemented in the AAIR programme a decision date of end of March 2000, at which time a decision to implement either the SHRS or the AAIR was required, whilst maintaining the installation deadline.

"Accordingly, a detailed critical design review of the AAIR was made mid March involving key AmSafe personnel. This convinced BAE that the programme to equip the fleet with AAIR by the end of 2000 was readily achievable and resulted in the continuation of the AAIR certification process.

"Subsequently, at a critical phase of the programme in July, dynamic certification testing was carried out, witnessed by CAA/ JAA. This had to be terminated due to the occurrence of design flaws which were unforseen by AmSafe/ BAE despite extensive development testing.

"Following identification of the causes of the problems, AmSafe has re-assessed the programme and has declared a two to three month slippage in the certification date.

"The consequence of this slippage has been that it is no longer possible for BAE to arrange for implementation of either the SHRS or the AAIR within the deadline of the

end of 2000, imposed by the FAA/ JAA. BAE Systems believe operators may not be able to commence modification of their aircraft until January 2001.

"BAE Systems remain committed to the AAIR in that it represents the preferred solution to front row HIC protection and believe that the AAIR will be certificated at or before the end of 2000.

"Operators of the Jetstream 4100 will be severely affected economically if there is not a solution available for retrofitting to their aircraft before the due date. This is because they will have to operate at a 10 percent reduction in passenger capacity and may be unable to use these aircraft on certain routes they have provided schedules for.

"Accordingly, BAE request FAA for a further extension of Exemption #5587 to be granted to permit an extension of the due date for implementation of the solution until the end of March 2001."

A summary of the petitioner's request appeared in the Federal Register on October 2, 2000 (65 FR 58840). No comments were received.

The FAA's analysis/summary is as follows:

The FAA notes that BAE Systems Regional Aircraft (formerly British Aerospace Regional Aircraft) has met the terms of Exemption #5587F by submitting a schedule for retrofit and developing a design solution to support that retrofit. It is evident that the design solution currently approved has not been embraced, and no operators have actually installed it. Consequently, compliance by the current deadline of December 31, 2000, is extremely unlikely.

In granting previous amendments to this exemption, the FAA gave much consideration to BAE's stated intention to utilize bulkhead mounted airbags. The FAA considers that inflatable restraint system schemes, when properly implemented, have the potential to provide enhanced occupant safety over that required, and should therefore be fostered where possible. When this approach could not be brought to fruition, BAE adopted an upper torso restraint installation as the method of compliance with HIC. This installation included restrictions on occupant size, which operators have been unwilling to adopt.

Because of operators' resistance to the upper torso restraints, BAE has decided to offer an integrated lapbelt airbag as a solution. In granting Exemption #5587F, the FAA noted that upper torso restraints were considered a viable option, and commercial resistance would not be considered a justification for further exemption. The FAA continues to hold this position, although operators' reluctance to accept restrictions on usage of specific seats is understandable. From a practical standpoint, installation of upper torso restraints on all affected airplanes by the current deadline is questionable at best, since no modifications have taken place to date. However, considering that more than three years will have passed since the grant of exemption #5567F, the FAA cannot justify an

extension on grounds of practicality. In any case, the amount of extension requested would also not appear to be sufficient to install the upper torso restraints, considering the extensiveness of the modification.

BAE Systems indicates that the decision to offer the inflatable lapbelt airbag was made in consideration of a schedule that would allow compliance in the required time, and that unforeseen circumstances have developed, which may prevent that. In light of the progress of the inflatable lapbelt airbag system, and its long term potential to provide enhanced occupant protection, the FAA considers that a short extension of the compliance time would be in the public interest, and would not compromise safety. However, it must be recognized that unforeseen circumstances are still a possibility, and operators must be prepared to be in compliance when this extension expires. That is, operators, in consultation with BAE, should allow for the contingency that progress of the inflatable lapbelt airbag program would not permit compliance by March 31, 2001. In that event, compliance will be required by other means (which could include upper torso restraints, non-occupancy of the affected seats or some other approach) and operators should plan accordingly.

In consideration of the foregoing, I find that a grant of exemption is in the public interest, and will not significantly affect the overall level of safety provided by the regulations. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), the petition of for an extension to Exemption #5587 regarding the HIC requirements of §§ 25.562(c)(5) and 25.785(a) of 14 CFR, for front row passenger seats on Jetstream Series 4100 airplanes, is granted until March 31, 2001, with the following provision:

This extension applies only to airplanes delivered prior to September 30, 1997.

Issued in Renton, Washington, on November 21, 2000.

/s/ Donald L. Riggin
Donald L. Riggin
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM-100